Stormwater Management Planning

Guiding Principles, Practices & Policies

1. **Establish stormwater planning goals for the site, such as:**
   - Peak flows *(flooding)*: Maintain/reduce peak flows to predevelopment conditions *(Note: Controlling flooding usually requires a larger watershed based analysis.)*
   - Water quality: Trap sediment & other pollutants in runoff (during/after construction)
   - Runoff volume/Infiltration: Prevent ponding/chronic wetness on downstream properties, and/or maintain predevelopment infiltration/groundwater recharge conditions
   - Temperature: Maintain/reduce predevelopment runoff temperatures (cold water stream)

2. **General stormwater plan guiding principles:**
   - Preserve natural flow paths, watershed boundaries & discharge points.
   - Ensure space is reserved for infiltration/treatment/detention.
   - Minimize impervious areas to reduce runoff and maximize infiltration.
   - Save natural & internally drained areas for infiltration & groundwater recharge.
   - Use native landscape plants to enhance filtering and infiltration (deeper roots).

3. **Water quality - treat/filter pollutants in runoff ("treatment train" concept):**
   - Encourage sheet flow off impervious surfaces to vegetation.
   - Encourage use of grass swales and open channels for runoff conveyance.
   - Use wet detention basins to trap sediment during and after construction.
   - Direct final discharges to stilling /infiltration basin and /or prairie & wetland plantings.

4. **Runoff volume/infiltration/temperature concepts:**
   - Separate clean water (roofs) and route to infiltration trench/basin.
   - Use pervious/absorbing surfaces where possible (pavers, sod roofs, etc.)
   - Pretreat polluted runoff before infiltration (highway, high density, commercial, industrial)
   - Extend underground soil contact time to reduce water temperature.
   - Reduce road widths and use of sidewalks (low travel areas, cul-de-sacs, etc.)

5. **Other planning, design & construction recommendations:**
   - Require soils/groundwater investigations to check site conditions against plans for infiltration, pond sealing and/or embankment construction.
   - Require stormwater practice designs to meet minimum state technical standards to ensure effectiveness and to minimize failure and related liabilities.
   - Require P.E. stamp on designs and on final construction certification ("as-builts") to ensure proper construction oversight and that the engineering plans are followed.
   - Consider minimum setback distances (from homes/external lot lines) from detention ponds to minimize future land use conflicts and liabilities.

6. **Provide for future stormwater system maintenance:**
   - Require drainage easements for all major flow paths to prevent obstruction.
   - Clarify structure/lot ownership and maintenance in recorded documents (no single owners)
   - Ensure recorded "back-up plan" for municipal enforcement of maintenance needs.
   - Ensure access easements for municipal inspections and maintenance equipment.
   - Plan for disposal of sediment removed from ponds, etc.
   - Consider municipal ownership and blending with park and open space plans.

7. **Prepare comprehensive watershed protection plans:**
   - Combine land use and stormwater planning to protect downstream resources BEFORE the watershed is developed.